PAST AND PRESENT DISTRIBUTION OF SOME RODENT AND INSECTIVORE SPECIES IN THE SOUTHERN CAPE PROVINCE, SOUTH AFRICA: NEW INFORMATION

By

D. M. Avery

South African Museum, Cape Town

(With 3 figures and 2 tables)

[*MS. accepted 11 August 1977*]

ABSTRACT

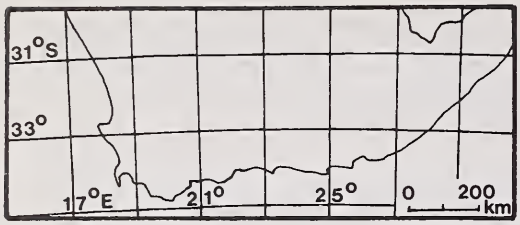
Micromammalian material from archaeological sites and modern owl roosts in the Cango valley and Gansbaai area of the southern Cape Province provides new information concerning the past and present distribution of certain species of rodents and insectivores. Modern material from the Cango valley provides evidence of a link between widely separated populations of several species and shows *Praomys natalensis* (multimammate mouse) to be co-existing with *P. verreauxi* (Verreaux's mouse). The archaeological evidence indicates that *Saccostomus campestris* (Cape pouched mouse) and *Steatomys pentonyx* (Cape fat mouse) arrived in the southern Cape only at the beginning of the Holocene about 10 000 years BP and that *P. natalensis* perhaps entered the Cango valley with the advent of farming in the area around 200 BP. On the other hand, *Tatera afra* (Cape gerbil), *Gerbillurus paeba* (pygmy gerbil) and possibly *Otomys unisulcatus* (bush Karoo rat) disappeared from the Cango valley some time after about 1 600 BP.

CONTENTS

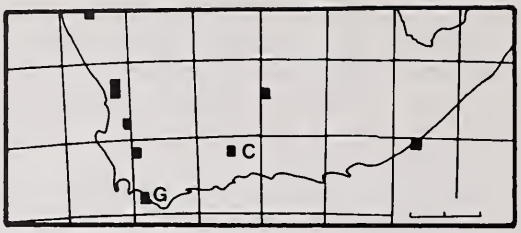
INTRODUCTION

The evidence put forward below became available during the course of a study of micromammalian remains from archaeological sites and comparable modern owl roosts in the southern Cape Province. Two areas are considered, the Cango valley (3322AC) near Oudtshoorn, and the Gansbaai area (3419CB) on the Walker Bay coast. For the Cango valley (Fig. 2) material was available from the archaeological site Boomplaas A (33°23′S 22°11′E) which represents well in excess of 40 000 years of accumulated deposit during the Upper Pleistocene and Holocene (Deacon & Brooker 1976: 211) and from five modern owl roosts. Two of these, Boomplaas B and C which are adjoining rock-shelters, are within 100 m of Boomplaas A and in the same cliff. Two others, Nooitgedacht A

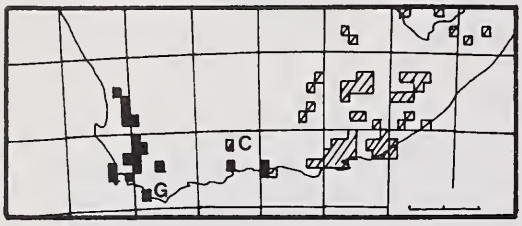
Ann. S. Afr. Mus. **74** (7) 1977: 201–209, 3 figs, 2 tables.



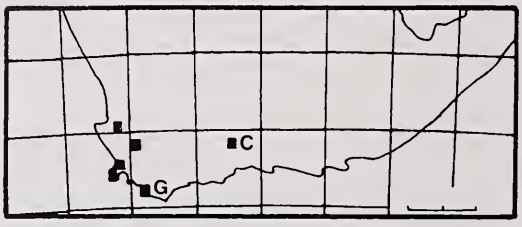
Base map



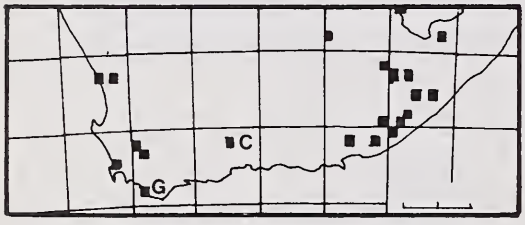
A Suncus varilla



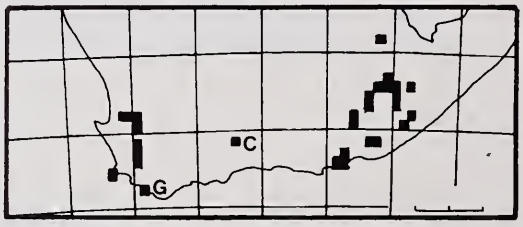
B Praomys verreauxi
P. natalensis



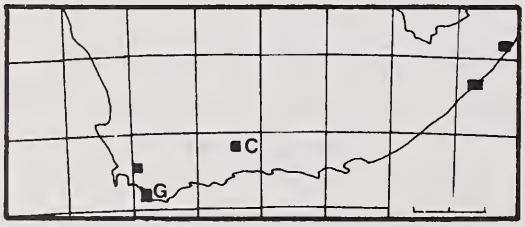
C Steatomys pentonyx



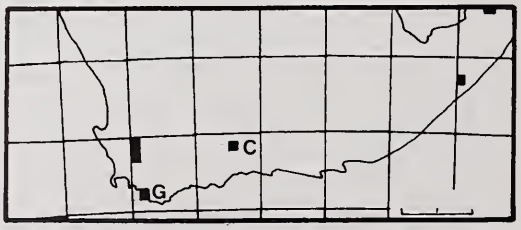
D Mystromys albicaudatus



E Otomys saundersae



F Otomys laminatus



G Dasymys incomtus

Fig. 1. Distribution of some rodent and insectivore species showing the relationship of the Cango valley (C) and Gansbaai (G) to existing ranges. A is based on Meester & Lambrechts (1971) and B and D–G are based on Davis (1974).

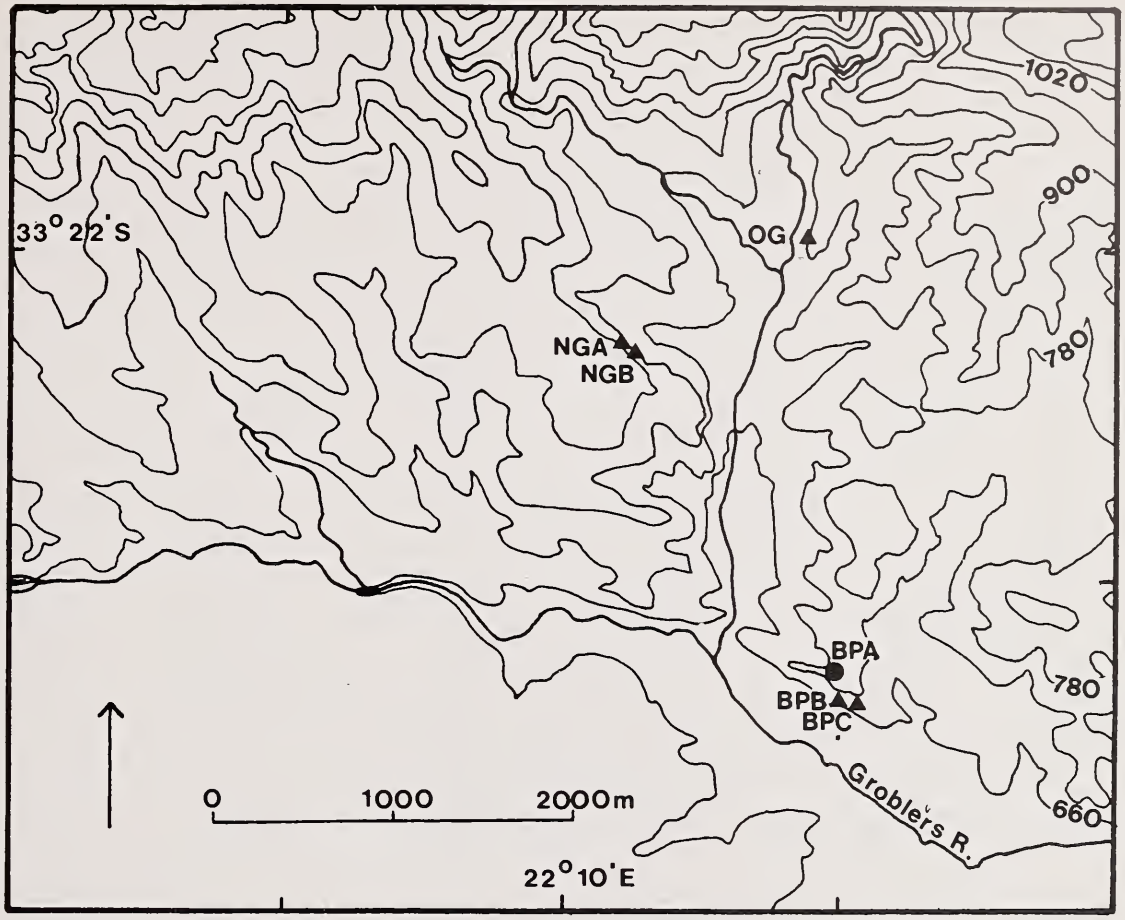


Fig. 2. The position of the sites in the Cango valley. BPA, BPB and BPC = Boomplaas A, B and C; NGA and NGB = Nooitgedacht A and B; OG = Osgat. Metric approximations of 200 ft contours are given.

and B (33°22′S 22°10′E) which are also adjoining rock-shelters, are situated 2,5 km north-west of Boomplaas, whilst the fifth site, Osgat (33°22′S 22°11′E), lies 1,3 km north-east of Nooitgedacht and 5 km north of Boomplaas. For the Gansbaai area (Fig. 3) archaeological material was available from Die Kelders 1 (34°32′S 19°22′E), covering a period from about 80 000 BP to 45 000 BP (years before present) during the Middle Stone Age (MSA) and from about 2 000 BP upwards during the Late Stone Age (LSA) (Tankard & Schweitzer 1974: 367; Tankard 1976: 155), and from Byeneskranskop 1 (34°35′S 19°28′E) which was occupied from about 12 000 BP upwards (F. R. Schweitzer pers. comm.) and which lies some 9,5 km south-east of Die Kelders. The modern sample was taken from Byeneskranskop 2, a rock-shelter situated just below the archaeological site and set in the same cliff. Total minimum numbers of individuals represented in the various samples are given in Table 1.

It appears from Davis's (1974) distribution maps that little collecting or recording has been undertaken in the two areas discussed here, although Grindley *et al.* (1973) collected owl pellets from near Stanford some 15 km north of Gansbaai. For this reason the recent information has proved useful both for

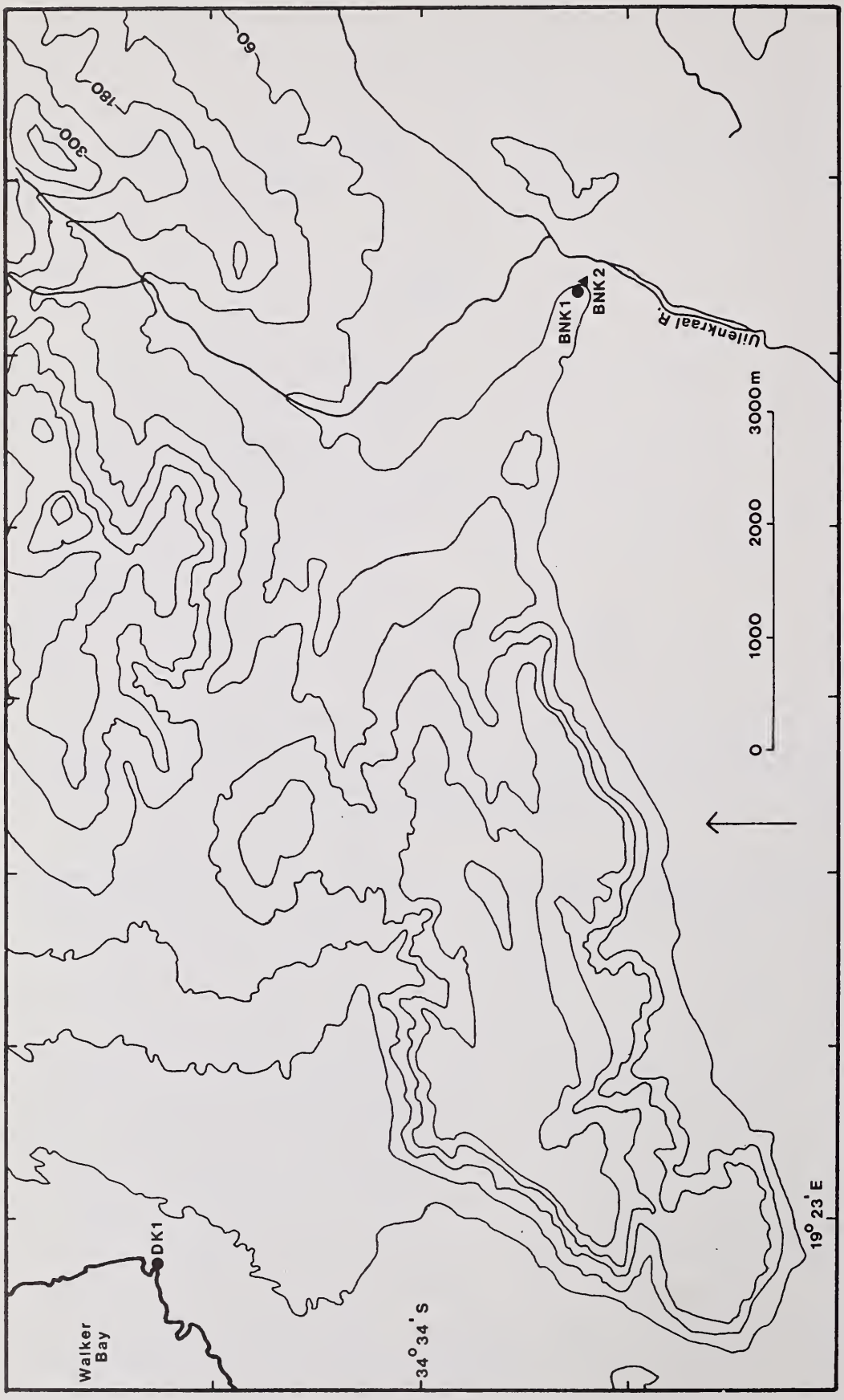


Fig. 3. The position of the sites in the Gansbaai area.

DK1 = Die Kelders 1; BNK = Byeneskranskop 1 and 2. Metric approximations of 200 ft contours are given.

consolidating known ranges and for filling in gaps in others less well known. Remains from archaeological contexts provide some indication of when various species arrived in or, in some cases, disappeared from the two areas.

PRESENT DISTRIBUTION

The presence of many of the species listed in Table 1 was predictable and in these cases the evidence merely adds another locality to an already clearly established range. In some cases, however, the sparseness of the existing record adds significance to the present information. *Acomys subspinosus* (Cape spiny mouse), *Saccostomus campestris* (Cape pouched mouse), *Dendromus melanotis* (grey pygmy climbing mouse), *D. mesomelas* (chestnut climbing mouse), *Crocidura flavescens* (red musk shrew), *C. cyanea cyanea* (reddish-grey musk shrew), *Suncus varilla* (lesser grey dwarf shrew) and, to some extent, *Praomys verreauxi* (Verreaux's mouse) fall into this category. The evidence confirms the ranges of *A. subspinosus* and *S. campestris* and also the eastward extent of the range of *P. verreauxi* as given in Davis (1974: 158, 163, 160 respectively). In the case of *D. melanotis*, *D. mesomelas* (Davis 1974: 166, 168) and *C. flavescens* (Meester 1963: 34) confirmation is provided for the existence of links between populations in the south-west and others in the south-east. For *S. varilla* the present information provides not only confirmation of similar linking but also constitutes a southwards extension of the known range given by Meester & Lambrechts (1971: 11) (Fig. 1A).

Further to this, and even more important, is another group of species which has been discovered in the Cango valley. For this group evidence of links between isolated populations had not previously been forthcoming. *Dasymys incomtus* (shaggy swamp rat), *Mystromys albicaudatus* (white-tailed rat), *Otomys laminatus* (laminate vlei rat), and *O. saundersae* (Saunders's vlei rat) comprise this group (Fig. 1D–G). It is interesting to note that Davis (1974: 166 et seq.) predicted that the gap was more apparent than real in several cases. Most of these species are not frequently caught by owls (Vernon 1972: 119). Assuming this to represent roughly the actual proportions of animals present, it is likely that still more records will become available with more intensive work. *Steatomys pentonyx* (Cape fat mouse) was also unexpected in the Cango valley but the situation regarding *Steatomys* spp. is complicated by the fact that this genus has long been in need of revision (Davis 1962: 73). Currently the south-western Cape population is referred to *S. pentonyx* and the more northern material to at least two other species. It is thought most likely that the present material represents a considerable eastward extension of the range of *S. pentonyx* (Fig. 1C).

Praomys natalensis (multimammate mouse) has not been thought to occur further west than about 24°E in the southern Cape, the more westerly area being occupied by *P. verreauxi* (Verreaux's mouse) (Fig. 1B). Indeed, Davis (1974: 160) doubted Pocock's identification of *P. natalensis* from Oudtshoorn, considering it more likely to be referable to *P. verreauxi*. However, material

TABLE 1

Insectivores and rodents occurring in the past and at present in the Cango valley and the Gansbaai area.

BPA(UP) and (H) = Boomplaas A (Upper Pleistocene) and (Holocene); BPB and BPC = Boomplaas B and C; NGA and NGB = Nooitgedacht A and B; OG = Osgat; DK1(MSA) and DK1(LSA) = Die Kelders 1 (Middle Stone Age) and (Late Stone Age); BNK1 and BNK2 = Byeneskranskop 1 and 2.

		Cango valley							Gansbaai area			
		BPA (UP)	BPA (H)	BPB	BPC	NGA	NGB	OG	DK1 (MSA)	BNK1	DK1 (LSA)	BNK2
INSECTIVORA												
Chrysochloris asiatica	Cape golden mole	—	—	—	—	—	—	—	×	×	×	×
Chlorotalpa sclateri	Sclater's golden mole	×	×	×	×	×	×	—	—	—	—	—
Amblysomus hottentotus	Hottentot golden mole	—	—	—	—	—	—	—	—	—	—	×
Elephantulus sp.	Elephant shrew	×	×	×	×	×	×	—	—	—	—	×
Crocidura flavescens	Red musk shrew	×	×	×	—	—	×	—	×	×	×	×
C. c. cyanea	Reddish-grey musk shrew	×	—	×	×	×	×	—	—	×	—	×
Myosorex varius	Forest shrew	×	×	×	×	×	×	×	×	×	×	×
Suncus varilla	Lesser grey dwarf shrew	×	—	×	×	×	×	×	×	×	×	×
RODENTIA												
Cryptomys hottentotus	Common mole-rat	×	×	×	×	×	×	—	—	×	—	—
Georhychus capensis	Cape mole-rat	—	—	—	—	—	—	—	×	×	—	×
Dendromus melanotis	Grey pygmy climbing mouse	×	×	×	×	×	×	—	×	×	×	× *
D. mesomelas	Chestnut climbing mouse	×	—	—	×	×	×	×	×	×	—	—
Saccostomus campestris	Cape pouched mouse	—	×	×	×	×	×	—	—	—	—	—
Steatomys pentonyx	Cape fat mouse	—	×	×	—	—	—	—	—	×	×	×
Mystromys albicaudatus	White-tailed rat	×	×	×	—	—	×	—	×	×	×	×
Tatera afra	Cape gerbil	×	×	—	—	—	—	—	×	×	×	×
Gerbillurus paeba	Pygmy gerbil	×	×	—	—	—	—	—	—	—	—	—
Otomys laminatus	Laminate vlei rat	×	—	×	×	×	×	×	—	×	—	×
O. saundersae	Saunders's vlei rat	×	×	×	×	×	×	×	×	×	×	×
O. irroratus	Vlei rat	×	×	×	×	×	×	×	×	×	×	×
O. unisulcatus	Bush Karoo rat	×	×	—	—	—	—	—	—	—	—	—
Acomys subspinosus	Cape spiny mouse	×	×	×	×	×	×	×	×	×	—	×
Aethomys namaquensis	Namaqua rock rat	×	×	×	×	×	×	×	—	×	—	×
Dasymys incomtus	Shaggy swamp rat	×	×	—	—	×	×	—	×	×	—	×
Mus minutoides	Dwarf mouse	×	×	×	×	×	×	—	×	×	—	×
Praomys natalensis	Multimammate mouse	—	—	×	×	×	×	×	—	—	—	—
P. verreauxi	Verreaux's mouse	×	×	×	×	×	×	×	×	×	×	×
Rattus rattus	Black rat	—	—	—	—	—	—	—	—	—	—	—
Rhabdomys pumilio	Striped field mouse	×	×	×	×	×	×	—	×	×	×	×
Graphiurus ocularis	Cape dormouse	×	—	×	—	×	×	—	—	—	—	—
Total minimum numbers of individuals represented		24 118	704	535	507	260	292	47	13 929	1 805	146	799

* undifferentiated—jaws lacking teeth

collected from the Cango valley by the writer contains examples of both *P. natalensis* and *P. verreauxi*. Not only does this confirm Pocock's findings, but it appears to be the first record of the two species' co-existing. It therefore goes some way towards establishing the boundary between the two species, for which Davis (1974: 160) saw a need. This boundary now lies along a line between Oudtshoorn and Plettenberg Bay but it seems likely that *P. natalensis* will yet be found further west in view of its liking for agricultural land, discussed below, and its highly successful nature.

Davis (1962: 62) remarked that *P. natalensis* is 'semi-domestic and present distribution is possibly dependent on having followed early human population movements'. It was probably early agricultural activity in particular which attracted it. Roberts (1951: 472) and Shortridge (1942: 60) note that it is common near cultivated land and the situation in the Cango valley seems to support this suggestion. At Boomplaas A microfauna has only been recovered from the pre-farming levels, the topmost of which is dated to 1 630 ± 50 BP (Deacon *et al.* 1976: 142). *P. natalensis* does not occur at all in these levels. It must, therefore, have arrived subsequently, possibly in the wake of European farmers who settled there around 200 BP. Not only does *P. natalensis* occur in significant numbers in the modern sample, but also there is a change in proportion between it and *P. verreauxi* in different parts of the valley (Table 2). At Boomplaas B

TABLE 2

Differences in the proportion of *Praomys natalensis* and *P. verreauxi* in the Cango valley. See Table 1 for explanation of abbreviations.

	BPB	BPC	Total	NGA	NGB	Total
Praomys natalensis	94	99	193	8	28	36
Praomys verreauxi	13	9	22	27	22	49

and C, which are situated on the hillside above the intensively farmed valley floor, there is a preponderance of *P. natalensis*, whereas at Nooitgedacht, in an uncultivated area, *P. verreauxi* tends to predominate. Whether the two species are in competition or whether a state of equilibrium has been reached remains to be seen. What is clear, however, is that *P. natalensis* is a recent newcomer to the area, apparently attracted by cultivated land.

PAST DISTRIBUTION

It is evident from Table 1 that the majority of species was present throughout the period of deposition in the caves. This presence was, however, intermittent in some cases, a fact which could well be due to a paucity of remains especially in the case of normally rare species such as *Dasymys incomtus* and *Otomys laminatus*. The former, for instance, has so far been found only from the lowest Holocene levels downwards at Boomplaas A but it is nevertheless present at Nooitgedacht; likewise at Byeneskranskop it occurs in one of the middle levels and then not again until the present. Several other species are not

represented in the Holocene levels at Boomplaas A, but none of them is ever numerous and the present sample is not large. In this situation presence is obviously more significant than absence and further sampling may prove the fluctuation to be artificial.

In other cases, however, the situation is much clearer. *P. natalensis* does not occur at all in the archaeological sample, as was mentioned above, whereas the opposite is true of *Tatera afra* (Cape gerbil), *Gerbillurus paeba* (pygmy gerbil) and *Otomys unisulcatus* (bush Karoo rat). The first two species occurred intermittently and the latter consistently throughout the Upper Pleistocene and Holocene levels at Boomplaas A, but are not represented in any of the modern samples collected at various times during the last two years from the Cango valley. The deserted nests of *O. unisulcatus* have, however, been found in the vicinity of Oudtshoorn (C. G. Coetzee pers. comm.) so it is possible that they may yet be found in the Cango valley. Two further species, *Saccostomus campestris* and *Steatomys pentonyx*, occur only in the Holocene and modern samples from the Cango valley. *S. campestris* does not occur in the Gansbaai area, but *S. pentonyx* has been found in the Die Kelders 1 LSA levels and at Byeneskranskop 1 and 2, but not in the Die Kelders 1 MSA levels. The evidence suggests, therefore, that these two species migrated into the southern Cape at the beginning of the Holocene some 10 000 or 12 000 years BP.

CONCLUSION

Increases in the record have been established for most of the species found. In some cases where previous records were widely scattered the present results provide significant confirmation of range. In others where the known pattern of distribution is markedly discontinuous the discovery of linking occurrences in the Cango valley shows that the disjunction is artificial. The occurrence of *Praomys natalensis* with *P. verreauxi* in the Cango valley is also of considerable interest since it establishes, at least provisionally, the boundary between the two species.

Some general information has emerged concerning the movements of certain species. The evidence seems secure for the arrival at the beginning of the Holocene of *Saccostomus campestris* and *Steatomys pentonyx* and for the more recent arrival of *Praomys natalensis*, and for the recent departure of *Tatera afra* and *Gerbillurus paeba*, while *Otomys unisulcatus* has possibly retreated from the valley to the plain. Other species have been present, at least intermittently, from the Upper Pleistocene to the present.

ACKNOWLEDGEMENTS

Thanks are due to the following for making material available: Dr H. J. Deacon, University of Stellenbosch (Boomplaas A), Mr F. R. Schweitzer, South African Museum (Die Kelders 1 and Byeneskranskop 1), and Mr G. Avery and Miss K. Scott, South African Museum (Byeneskranskop 2). Mr A. Botha kindly pointed out owl roosts in the Cango valley.

REFERENCES

DAVIS, D. H. S. 1962. Distribution patterns of southern African Muridae, with notes on some of their fossil antecedents. *Ann. Cape prov. Mus.* **2**: 56–76.

DAVIS, D. H. S. 1974. The distribution of some small southern African mammals (Mammalia: Insectivora, Rodentia). *Ann. Transv. Mus.* **29**: 135–184.

DEACON, H. J. & BROOKER, M. 1976. The Holocene and Upper Pleistocene sequence in the southern Cape. *In:* Proceedings of the Southern African Society for Quaternary Research. *Ann. S. Afr. Mus.* **71**: 203–214.

DEACON, H. J., DEACON, J. & BROOKER, M. 1976. Four painted stones from Boomplaas Cave, Oudtshoorn District. *S. Afr. archaeol. Bull.* **31**: 141–145.

GRINDLEY, J., SIEGFRIED, W. R. & VERNON, C. J. 1973. Diet of the Barn owl in the Cape Province. *The Ostrich* **44**: 266–267.

MEESTER, J. 1963. A systematic revision of the shrew genus *Crocidura* in southern Africa. *Transv. Mus. Mem.* **13**: 1–127.

MEESTER, J. & LAMBRECHTS, A. VON W. 1971. The southern African species of *Suncus* Ehrenberg (Mammalia: Soricidae). *Ann. Transv. Mus.* **27**: 1–14.

ROBERTS, A. 1951. *The Mammals of South Africa.* Johannesburg: The Trustees of 'The Mammals of South Africa' Book Fund.

SHORTRIDGE, G. C. 1942. Field notes on the first and second expeditions of the Cape museums' mammal survey of the Cape Province: descriptions of some new subgenera and subspecies. *Ann. S. Afr. Mus.* **36**: 27–100.

TANKARD, A. J. 1976. The stratigraphy of a coastal cave and its palaeoclimatic significance. *Palaeoecol. Afr.* **9**: 151–159.

TANKARD, A. J. & SCHWEITZER, F. R. 1974. The geology of the Die Kelders Cave and environs: a palaeoenvironmental study. *S. Afr. J. Sci.* **70**: 365–369.

VERNON, C. J. 1972. An analysis of owl pellets collected in southern Africa. *The Ostrich* **43**: 109–124.